Space Weather Forecast

Issued on Sunday, 29 January 2023 at 00:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of R1/R2 Radio Blackouts. Slight chance of Minor Geomagnetic Storm on Day 4 (1 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low with the largest Common class flare observed at midday UTC from one of the small regions in the northwest. There are currently seven sunspot regions on the visible disc and these appear small, magnetically simple and mostly stable or in decay. Two regions, in the northwest and southwest have shown slight growth.

No Earth-directed Coronal Mass Ejections (CMEs) were observed.

Solar Wind / Geomagnetic Activity: The solar wind has been at elevated levels under the influence of a fast solar wind stream. The total Interplanetary Magnetic Field was at Weak levels, as was the important northwards/southwards direction. Geomagnetic Activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be predominantly Low, with a slight chance of a Moderate-class flare.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected.
Solar winds, initially at elevated levels through Day 1 (29 Jan), are expected to show a gradual decline in the coming days, perhaps to slow-ambient levels by Day 3 (31 Jan). A further pair of coronal holes may start to give an increase in wind speeds from later on Day 3, but it is more likely to occur Day 4 (1st Feb).

Geomagnetic activity is expected to be Quiet to Unsettled (Kp 0-3) for much of the period. From Day 3 (31 Jan) a slight (5-10%) chance of G1/Minor Storms (Kp 5) has been indicated assuming we do see further coronal hole influence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is currently expected to remain at background levels with no solar radiation storms.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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